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10/698,448

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David Sparrowe

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EXAMINER

LSTVOYB, GREGORY

ART UNIT

PAPER NUMBER

1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/698,448

Applicant(s)

SPARROWE ET AL.

Examiner

GREGORY LISTVOYB

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
4a) Of the above claim(s) 18-20 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-17 and 21-45 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claim 1 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for melamine-formaldehyde resins (see Examples), does not reasonably provide enablement for any other amine -containing material. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

the court set forth eight factors to consider when assessing if a disclosure would have required undue experimentation. Citing *Ex parte Forman*, 230 USPQ 546 (BdApl's 1986) at 547 the court recited eight factors:

(1) The nature of the invention; (2) the state of the prior art; (3) the relative skill of those in the art; (4) the predictability or unpredictability of the art; (5) the breadth of the claims; (6) the amount of direction or guidance presented; (7) the presence or absence of working example and (8) the quantity of experimentation necessary.

The nature of the invention and breadth of claims

The claimed invention is an electronic device, which predominantly contain melamine-formaldehyde resin. Therefore, the scope of the Claims ("organic amine derivative", multifunctional polymeric compound and initiator, meaning any amine derivative, any multifunctional polymeric compound and any initiator) is much broader than one disclosed in the Specification.

The state of the prior art

In the prior art to US 2001/0025414 as discussed below, a multilayered wiring board (electronic device, see Abstract) comprising Methoxymethylolmelamine (Cymel 370, see line 99). Therefore, US 2001/0025414 reference represents only a limited teaching of cross-linkable Melamine-containing material for used for electronic device.

The presence or absence of working example:

Only Melamine-formaldehyde-based amines presented in Examples. There is no Component B presented.

Note that the working example is critical factor to be considered, especially in a case involving an unpredictable and undeveloped art such as analysis of film anisotropy with humidity expansion parameter See MPEP 2164.

The quantity of experimentation necessary.

2. It is concluded that it would have require undue experimentation for one having ordinary skill in the art to practice the claimed invention to find appropriate step to expand the applicant's teaching to any other type of amines, besides one based on Melamine-formaldehyde-based amines• The above is applicable to a multifunctional organic compound and an initiator. In re Wands, 858, F.2d at 737, 8 USPQ 2d 1400, 1404 (Fed Cir. 1988).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6 rejected under 35 U.S.C. 102(b) as being anticipated by Toyoshima et al (US 2001/0025414), herein Toyoshima.

Toyoshima discloses a multilayered wiring board (electronic device, see Abstract) comprising Methoxymethylolmelamine (Cymel 370, see line 99), which is capable of forming a crosslinked polymer with itself and/or with at least one multifunctional compound and polyvinyl acetal, which is reactive derivative from polyvinyl alcohol, which has Hydroxyl groups (see line 0099, Example 1).

In addition, Toyoshima teaches Butadiene Acrylonitrile copolymer, which can be considered as a component B, since Acrylonitrile fragment can be considered as acid derivative and it hydrolyses in water yielding amido groups. Since the amount of Cymel is 50 g and amount of Butadiene Acrylonitrile copolymer is 15 g, the melamine constitutes at least 75%wt of the total composition of A and B. (Note that either Polyvinyl Acetal and Butadiene Acrylonitrile copolymer or both can be considered as a component B based on the language of Claim 1).

In addition, Toyoshima teaches water soluble melamine-type cross-linking agents (see line 0063) and water insoluble siloxane, melamine resins, acrylate resins, etc (see line 0067).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-5, 7-17, 21-30, 33, 38-45 rejected under 35 U.S.C. 103(a) as being unpatentable over Toyoshima or Knudsen (US 2002/0176989, cited in the previous Office Action) herein Knudsen in combination with Chen et al (US patent 5330840, cited in the previous Office Action) herein Chen.

Toyoshima discloses a multilayered wiring board (electronic device, see Abstract) comprising Methoxymethylolmelamine (Cymel 370, see line 99), which is capable of forming a crosslinked polymer with itself and/or with at least one multifunctional compound and polyvinyl acetal, which is reactive derivative from polyvinyl alcohol, which has Hydroxyl groups (see line 0099, Example 1). The above components comprise at least 75%wt of the total composition.

In addition, Toyoshima teaches water soluble melamine-type cross-linking agents (see line 0063) and water insoluble siloxane, melamine resins, acrylate resins, etc (see line 0067).

Knudsen discloses a cross-linked polyurethane based material used as a dielectric layer in printed circuit boards and other electronic devices (Abstract, line 0031 line 0051), which can contain ceramic materials (see line 0019).

Regarding claim 10 and newly added claim 45, Knudsen teaches number of polymers, some of which (i.e. polystyrene) can not be considered as component B, since they don't have functional groups, claimed in claim 1.

The above ceramics increase dielectric resistance of the coating.

Toyoshima or Knudsen do not teach exact amine derivative as a crosslinked agent as claimed in claim 2.

Chen discloses a composition formed with cross-linkable melamine formaldehyde resin 2-80% of Cymel 303 as well as Cymel 380 and 385 (Column 6, line 5 and Claim 3), which is identical to one used in the Application examined (see page 24, mixture M1 of the Application), 25-60% of polyurethane-siloxane (Column 6, line 5 and Claim 1), 0.001-1% of acid catalyst (Column 7, line 5, meeting the limitations Claims 30 and 39) and a solvent.

In reference to Claim 16, 29, 40 and 44, Chen discloses the use of 1,4 butanediol (see Table). Chen teaches that 1,4 butanediol used as a part of polyurethane reaction mixture. However, chen teaches that the above component is used in excess. Therefore, presence of free 1,4 butanediol is expected in the final composition.

Regarding Claim 33, Chen discloses a solvent THF (i.e. ether).

In reference to Claim 41, Chen discloses a coating with thickness of 0.5- 50 um (see Column 7, line 30).

Since Chen's composition has an excellent flexibility, adhesion to a metal surface and low dielectric constant, it would be obvious to a person with ordinary skills in the art to use it in Toyoshima/Knudsen's electronic device, including circuit boards.

Regarding Claim 42, Knudsen and Chen do not disclose dielectric layer with dielectric constant greater or equal 4.

However, since Chen's composition essentially has the same base material (i.e. up to 80% of Cymel) and thickness of 0.5-50 um, it has the same dielectric properties as the dielectric of the Application examined.

Claims 31-37 rejected under 35 U.S.C. 103(a) as being unpatentable over Knudsen or Toyoshima in view of Chen and further view of Baranczyk et al (US 2004/0044165) herein Baranczyk.

Knudsen or Toyoshima discloses a cross-linked polyurethane based material used as a dielectric layer in an electronic device (see discussion above).

Chen discloses a composition formed with cross-linkable melamine coating (see discussion above).

Knudsen or Toyoshima and Chen do not disclose para-toluene sulfuric acid as a catalyst, surfactant and a butanol as a solvent.

Baranczyk discloses a coating composition based on siloxanes (see line 0027), urethanes (see line 0049), diols (line 0061) and cross-linking agent, based on Cymel

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(see line 0082). Note that Barancyk's composition includes the same ingredients as Chen's one.

Barancyk uses para-toluene sulphonic acid as a catalyst (see line 0215). The advantage of the above catalyst compare to TFA used by Chen is that para- toluene sulphonic acid has much higher boiling point, making possible high temperature cure.

Therefore, it would have been obvious to a person of ordinary skills in the art to use para-toluene sulphonic acid as a catalyst to perform high temperature curing process.

Barancyk uses 5-80% of butanol and ketones as a solvent (see lines 0213-0214). Butanol is a commonly used solvent with hydrophilic-lipophilic properties. The advantage of butanol over THF or chlorinated hydrocarbons used by Chen is its lower toxicity and price.

Therefore, it would have been obvious to a person of ordinary skills in the art to use butanol as a solvent in Chen's composition, due to its lower toxicity and price.

Barancyk uses polyoxyethylene (Pluronic) as a surface active agent (see line 0199). The use of the above agent allows better contact between the composition and a substrate.

Therefore, it would have been obvious to a person of ordinary skills in the art to use polyoxyethylene (Pluronic) as a surface active agent in Chen's composition, providing better contact between a substrate and the composition.

Response to Arguments

Applicant's arguments filed on 5/13/2008 have been fully considered but they are not persuasive.

Applicant argues that when Wand's factor applied, before the issue of undue experimentation arises, the PTO must present reasons to doubt the veracity of the objective enablement statements presented in an applicants' specification.

In particular, Applicant states that even with respect to determining whether undue experimentation is needed, breadth is but one of the Wands factors, not a determinative factor.

Examiner disagrees. Breadth of claim is one of eight Wand's factors, which can be equally applied. The Law does not require what all of the Wand's factors should be applied. In the previous Office Action three of the above factors are analyzed (see discussion above). Unfortunately, the Applicant does not present any factual arguments in order to rebut the previous rejection.

Regarding Toyoshima, Applicant argues that reference does not meet applicants' claim 1 recites that the composition contains at least 75% by weight of component A based on the total weight of components A, B, and C.

This is incorrect. Applicant's claim contains open language ("comprising"), which mean that that either Polyvinyl Acetal and Butadiene Acrylonitrile copolymer or both can be considered as a component B based on the language of Claim 1. among them at least Butadiene Acrylonitrile copolymer meets the above claim limitations.

Regarding Chen, Applicant argues that polyurethane-polysiloxane block-copolymers would not be as a multifunctional organic compounds.

This is incorrect statement. Even polydimethylsiloxane alone can be considered as a multifunctional organic compound, since it has multiple functional groups.

Applicant argues that It is noted that Chen broadly disclose that the amount of melamine resin can be 2-80 wt. %. However, the disclosure clearly suggests using amounts that are much lower than 80 wt. %. For example, 10-40 wt. % is preferred (column 6, lines 6-9).

First, Chen is a secondary reference. Primary reference Toyoshima teaches more than 75% wt of component A.

Second, according to MPEP 2123, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (see also *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971), *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994) , *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

Applicant argues that Chen does not teach that his laminate can be used in electronic device.

However, as mentioned in the discussion above, Chen's composition has an excellent flexibility, adhesion to a metal surface and low dielectric constant, it would be obvious to a person with ordinary skills in the art to use it in Toyoshima/Knudsen's electronic device, including circuit boards.

In another words, Chen's invention solves the same problem, which are important circuit board design.

Applicant argues that Chen does not have the same dielectric constant as a composition of the Application. However, as stated above, since Chen's composition essentially has the same base material (i.e. up to 80% of Cymel) and thickness of 0.5-50 μm , it has the same dielectric properties as the dielectric of the Application examined.

Regarding Knudsen, the Applicant argues that it is evident that this is a vast grouping of polymers. It is noted that polyurethanes are included within this extremely broad genus. However, it would have been obvious to a person of ordinary skills in the art that virtually any of them can be used in the composition with reasonable expectation of success.

The Applicant argues that polyorganosiloxanes are not included in the list above. The new Toyoshima reference presents polyorganosiloxanes as an insulating material in electronic devices.

The Applicant has no argument on the rejection under 35 USC 103(a), based on a combination of Toyoshima/Knudsen/Chen and Barancyk.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY LISTVOYB whose telephone number is (571)272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rabon Sergent/
Primary Examiner, Art Unit 1796

GL

